

Name: \_\_\_\_\_

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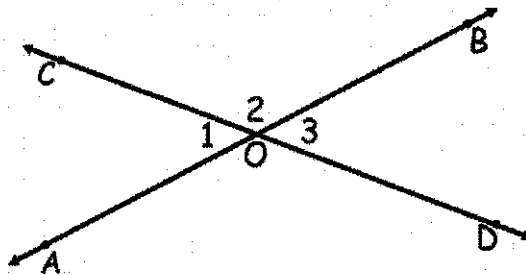
Per.: \_\_\_\_\_

### 1.13 Proving the Vertical Angles Theorem

**Theorem:** Vertical angles are congruent.

**Given:**  $\angle AOB$  and  $\angle COD$  are straight angles

**Prove:**  $\angle 1 \cong \angle 3$

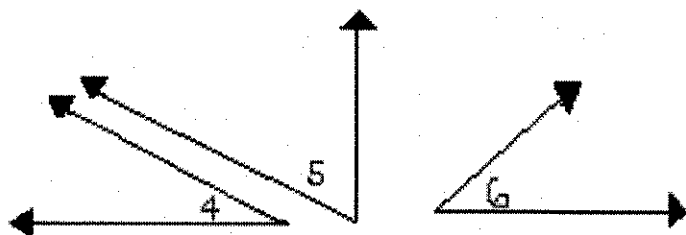


#### Statements

#### Reasons

- |   |  |
|---|--|
| <p>① <math>\angle AOB</math> and <math>\angle COD</math> are straight angles</p> <p>② <math>\angle 1</math> and <math>\angle 2</math> are a linear pair<br/><math>\angle 2</math> and <math>\angle 3</math> are a linear pair</p> <p>③ <math>\angle 1</math> and <math>\angle 2</math> are supplementary<br/><math>\angle 2</math> and <math>\angle 3</math> are supplementary</p> <p>④ <math>m\angle 1 + m\angle 2 = 180^\circ</math><br/><math>m\angle 2 + m\angle 3 = 180^\circ</math></p> <p>⑤ <math>m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3</math></p> <p>⑥ <math>m\angle 1 = m\angle 3</math></p> <p>⑦ <math>\angle 1 \cong \angle 3</math></p> | <p>① Given</p> <p>② They are both pairs of adjacent, supplementary angles (def. of linear pair)</p> <p>③ If two angles form a linear pair, then they are supplementary</p> <p>④ If two angles are supplementary, then they sum to <math>180^\circ</math> (def. of supplementary)</p> <p>⑤ Substitution prop.</p> <p>⑥ Subtraction prop.</p> <p>⑦ angles that have equal measure are congruent (def. of congruent angles)</p> |
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### 1.13 Proving the Congruent Complements Theorem



**Given:**  $\angle 4$  is complementary to  $\angle 5$  and  $\angle 6$  is complementary to  $\angle 5$

**Prove:**  $\angle 4 \cong \angle 6$

Statements	Reasons
① $\angle 4$ is complementary to $\angle 5$ , and $\angle 6$ is complementary to $\angle 5$	① Given
② $m\angle 4 + m\angle 5 = 90^\circ$ $m\angle 5 + m\angle 6 = 90^\circ$	② complementary angles sum to $90^\circ$ (def. of complementary)
③ $m\angle 4 + m\angle 5 = m\angle 5 + m\angle 6$	③ Substitution Prop.
④ $m\angle 4 = m\angle 6$	④ Subtraction prop.
⑤ $\angle 4 \cong \angle 6$	⑤ angles equal in measure are congruent (def. of $\cong$ angles)

[illegible]